Canadian Stock Assessment
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PROCEEDINGS OF PEER REVIEW AND CLIENT CONSULTATIONS

FOR DIADROMOUS FISH STOCKS (SALMON)

IN THE MARITIME PROVINCES

IN 1996

DIADROMOUS FISH DIVISION
MARITIMES REGION
343 ARCHIBALD STREET
MONCTON, N.B.
E1C 9B6

April 1997

Fisheries and Oceans Science
Pêches et Océans
Canada

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Table of Contents

Part I Peer Review

Introduction 1

Environmental Conditions
- Freshwater Environmental Conditions 2-3
- Freshwater Acidity Conditions 4-6
- Marine Environmental Conditions 7-9

Striped Bass
- Southern Gulf 10-11

Atlantic Salmon
- Restigouche SFA 15 12-14
- Nepisiguit and Jacquet SFA 15 15-17
- Miramichi SFA 16 18-19
- Buctouche SFA 16 20-21
- Prince Edward Island SFA 17 22-23
- North Shore Nova Scotia SFA 18 24-26
- Cape Breton SFA 18 (part) & SFA 19 27-28
- Eastern Shore Nova Scotia SFA 20 29-32
- Southern Nova Scotia SFA 21 33-34
- Inner Bay of Fundy SFA 22 & part of SFA 23 35-36
- Southwest New Brunswick SFA 23 37-38

Part II Consultations

Introduction 39

Striped Bass
- Miramichi River/Southern Gulf of St. Lawrence 40-41

Atlantic Salmon
- Restigouche SFA 15 42-43
- Nepisiguit and Jacquet SFA 15 44-45
- Buctouche SFA 16 46-47
- Northumberland Strait and Portion of SFA 18 48-49
- Cape Breton SFA 18 (part) & SFA 19 50-53
- Eastern Shore Nova Scotia SFA 20 54-55
- Southern Nova Scotia SFA 21 with emphasis on Upper Lahave River 56-57
- Southwest New Brunswick (Saint John) SFA 23 58-59

Table of Contents

Part III Appendices

Appendices

Letter of Invitation (Clients & other interests) 60
Mailing List 61-71
Referees Mailing List 72-75
Attendance List 76-77
Agenda with Rapporteur Assignments 78-79
Letter of Invitation (Referees) 80
Peer Review Schedule (List of Referees) 81

Part I

Peer Review

1.0 INTRODUCTION

This report provides records of both the peer review meeting for assessing the status of the diadromous fish stocks in 1996 and the client consultation meetings held prior to the peer review meeting.

The Peer Review took place February 3-7, 1997, at the Gulf Fisheries Centre, Moncton, New Brunswick. Participants numbered 49 and, in addition to Diadromous Fish Division members, were comprised of individuals or representatives from provincial agencies (New Brunswick, Nova Scotia and Quebec, foreign countries (France and Japan), local universities (Moncton and University of New Brunswick), one other federal agency, DFO Science organizations (Ottawa and Newfoundland), other Divisions of the Department of Fisheries and Oceans' (DFO) Regional Science Branch, DFO Headquarters Science, and client interests (Aboriginal, recreational and commercial fishing). The letter of invitation to clients and other interests outside DFO and both mailing and attendance lists are attached in appendices 1.1, 1.2, 1.3, and 1.4.

Eleven stock assessment documents and three environmental overview papers were reviewed during the five-day peer review session (see Agenda in Appendix 1.5). Thirty referees contributed to the review of the 14 working papers (letter of invitation with instructions and list of referees attached in appendices 1.6 and 1.7). Each paper was formally reviewed by two referees and, also, was opened-up to questioning and comment from all the participants in attendance. One referee, absent from the Peer Review meeting, provided written comments which were presented by an attending referee. The comments and concerns, with the author's responses, are summarized in the rapporteur reports prepared for each of the 14 working papers presented and are detailed in Peer Review pages 2-33 of this report. These same reports detail the research and management recommendations and, as applicable and feasible, the management advice for both the coming year and the long term.

Part II contains the written records of the client consultation meetings held prior to the Peer Review meeting. The purposes of these consultations were to provide a preliminary status report on the stocks to clients and other interested parties, to gather any additional information and insights that they might contribute, and to seek suggestions on how to improve the assessment in the future. Some of these consultations were conducted as science-only workshops while others were carried out under broader agendas usually dealing with a wider range of fisheries management aspects. Although there were inconsistencies in both meeting formats and written records among the various consultations, coverage of science matters was generally consistent.

ENVIRONMENTAL CONDITIONS

Freshwater Environmental Conditions

Rapporteur: **Kevin Davidson**

Working Paper Title: **Freshwater Environmental Conditions**

Author(s): **Daniel Caissie**

Referees: **Ken Drinkwater**
Walton Watt

Introduction:
Precipitation, flow, and water temperature data collected/obtained from a number of sites and sources across the Maritime provinces in 1996 were presented and compared. Where data series permit, the 1996 data were compared to both long and short term means and trends. A number of major hydrological events recorded in 1996 were highlighted. An initial analysis of the effects of flow on the timing of upstream salmon movement was also presented.

Concerns:
Referees:
1. the time scale of long term means should be specified and should be standardized when making comparisons between sampling locations.
2. flow data, particularly winter flows, are estimates. Most recent/short term flow data is provisional and may be subject to change when corrections are made for various hydrological factors.
3. autocorrelation of variables in environmental data sets should be recognized and accounted for in determining significant levels in correlation or regression analyses.
4. most environmental data are not available until late in the year and are therefore difficult to refine and analyse in time for inclusion into annual assessments.

Others:
1. there is currently no low cost method of collecting flow data and no "user friendly" method of downloading and analyzing data from some of the data logging systems currently available.
2. concern was expressed that the data collection and analysis did not appear to be empirically driven (ie. was not done in support of a predetermined hypothesis). It was noted that it was not intended that the author be responsible for generating and testing such hypotheses but rather that he make the biologists aware of the types of data available and how it they could be used. It is then incumbent upon the biologists to generate and test the hypotheses.
3. partitioning environmental data sets and performing exploratory analyses may be useful in generating and testing hypotheses.

ENVIRONMENTAL CONDITIONS

Freshwater Environmental Conditions

Recommendations

1. presentation of multi-year time series (eg. at least 5 to 6 years) for the various sampling locations would be more useful in terms of being able to interpret the effect of environmental variables on Atlantic salmon cohorts.
2. graphs (as well as tables) of both monthly mean flows and the long term monthly means would be instructive for comparison of recent events to long term trends.
3. an index of temperatures or flows above and/or below pre-defined levels (eg. the total degree days above 21 °C and number of occurrences) would be useful.

Fisheries Management Advice

1. recent and long-term environmental conditions should be considered when generating both biological and management advice to avoid interpreting biological responses to short term environmental events or anomalies as biological trends.

DATE: February 6, 1997

ENVIRONMENTAL CONDITIONS

Freshwater Acidity Conditions

Rapporteur: **Carolyn Harvie**

Working Paper Title: **The Atlantic Region Acid Rain Monitoring Program in Acidified Atlantic Salmon Rivers: Trends and Present Status**

Author: **Walton Watt**

Referees: **Daniel Caissie**
Rick Cunjak

Introduction:
The effects of acid precipitation and consequent river acidification were examined in relation to various other environmental variables and their combined effect on juvenile salmonid densities in streams which have had pH levels in the near-lethal range (~5.0-5.4). The area examined was the Southern Uplands of Nova Scotia over the period 1981 to 1996.

Concerns:
Referees:

1. With regard to the locally-sourced sulfate depositions in rivers surrounding Halifax, how much confidence is there that other rivers of the Southern Uplands area were not affected?
   Response: The Halifax problem extends 30 km from Halifax; also, the prevailing wind is west and the rivers are east of Halifax.

2. Both DFO and Environment Canada data were used. Was a comparison done between the two?
   Response: DFO pH data were used because the samples collected were analysed immediately. There was good agreement between the two sets (correlation 0.96).

3. Was water temperature the driving force in the statistical model? How was it measured?
   Response: Water temperature was the driving force in the trends in organics (organics control pH). A standard mercury thermometer was used for measurement.

4. The document reported a significant increase of 0.5 degrees C over 12 years with a p-value of 0.05. Is this considered significant for that fine a change in temperature?
   Response: It is significant, likely as significant as it will get, as there is so much noise in the data.

5. For rivers which are below borderline pH, would an increase in pH show an effect on fish

ENVIRONMENTAL CONDITIONS

Freshwater Acidity Conditions

populations?
Response: An increase would be expected, but not right away (they have to be colonized or stocked first). A quick response would be expected from borderline-pH rivers where remnant stocks are still present.

6. In the document's introduction, the basic objective is not stated clearly.
Response: The objective is in the title.

7. What is the methodology used for electrofishing? This should be noted in the document.
Response: A separate data report will be issued on the electrofishing. Two types were used: for low populations, an open station in one pass; for higher populations, barrier nets with multiple passes. A comparison between the two methods showed a good relationship (regression). One method was used to predict the other.

8. The figure showing the relationship between air and water temperatures breaks apart around 1986. Ideas on what happened?
Response: Don't know. Worth looking at.

9. Concerning the trends in DOC and pH levels over years, do they still work on a river by river basis?
Response: The trends are virtually the same in all rivers.

10. Concerning the acid event in 1994 and the detrimental impact on fry densities, could the lack of fry be caused by lack of egg deposition in the previous year? Need data to support this. Does this apply to borderline-pH rivers in general?
Response: Egg depositions in 1993 will be examined. A figure will be added to the document for juvenile levels at the high pH control sites.

Others:

1. Given that the annual air and water temperatures presented were based on a number of sites, what is the variability about each of the yearly means? Also what is the sampling frequency? Are the effects of sampling frequency biasing the yearly mean?
Response: The variability is small. The sampling frequency is monthly, and does not appear to bias the yearly mean.

2. There is a need to control for the previous year's escapement as a contributor to the increase in fry densities. Use wild escapement from Morgan Falls in the model for all Southwest Nova rivers. The premise is that the increase in fry densities has more to do with the management plan, not pH.
Response: A figure will be added to the document showing juvenile levels at the high pH sites.

ENVIRONMENTAL CONDITIONS

Freshwater Acidity Conditions

3. The data show that pH levels have been plummeting since 1992, but the document is optimistic about the future. Why?
   Response: pH levels came down as a result of temperature changes which are not likely to continue. On the other hand, the Canada/USA treaty will result in massive emission declines after the year 2000. This should benefit pH levels over the next 5-10 years.
4. In light of the acid event in 1994 and its impact on fry densities, is there enough evidence to suggest there should be concerns regarding returns of grilse in 1997 along the coast of Nova Scotia for borderline-pH rivers?
   Response: The impact of the 1994 event should be kept in mind when doing 1997 assessments.

Date: February 13, 1997

ENVIRONMENTAL CONDITIONS

Marine Environmental Conditions

Rapporteur: **Paul Cameron**

Working Paper Title: **Marine Environmental Conditions**

Author(s): **Ken Drinkwater**

Referees: **N/A**
N/A

Introduction:
This paper presents atmospheric and physical oceanographic conditions during 1996 that may have influenced Atlantic salmon (Salmo solar) stocks during their marine phase.

Concerns:
Referees: **N/A**

Others:
1. With regard to air temperature trends, has there been greater variability within months in recent years?
   Response: Only monthly means have been used in the analysis, therefore can not tell whether there has been an increase of within month variability.

2. Is there any way to predict temperature variability in our region from what occurs in the North Pacific?
   Response: There is no known relationship between events in the North Pacific and the Atlantic that could be used in a predictive mode. If we could predict weather months or years in advance, we could predict ice extent and sea surface temperatures, however, we cannot predict the weather. Based on past variability, it suggests that NAO index will likely remain low and air temperature should then continue to remain higher-than-normal. Such a trend is expected to continue for the next few years.

3. Satellite information can be spotty due to cloud cover, etc. Will the fixed stations be able to fill in some of the missing satellite information?
   Response: A comparison between Scotian Shelf fixed stations and satellite sea surface temperatures has been encouraging. However, they do not provide the spatial resolution needed. By making monthly composites of the satellite data clouds should not be too much of a problem.

4. What is the relationship between icebergs and temperature?
   Response: There are more bergs when the temperature is colder but it appears to be related more to the extent of sea ice. Ice can protect bergs from wave action. The number of

ENVIRONMENTAL CONDITIONS

Marine Environmental Conditions

icebergs off Newfoundland were down a factor of one-third to one-half in 1996 over the last several years.

5. Was there an effect of the Mount Pinatubo volcanic eruption in local air temperatures?
   Response: Personal feeling that there was no Pinatubo effect, the changes in the air temperature records around the time of the volcano are within the variability we've experienced previously. It is difficult to prove one way or the other, however.

6. Appears to be almost a ten year cycle in the air temperatures; where are we on that cycle?
   Response: Period is not exactly ten years but close, since the 1960s. Not sure where we are in the cycle but based on past data would project that air and sea temperatures will remain higher than normal for the next two to three years. The NAO index has recently declined. The amplitude of the NAO index appears important in explaining climate variability in the Labrador Sea but also the longitudinal position of the Icelandic Low is also important.

7. Was position of Icelandic Low accounted for in the analysis?
   Response: No. The large change in NAO observed this year may indicate a regime shift. Since the 1960s have had near ten year cycle. Prior to that, there was a High over Greenland that blocked the low pressure storms from entering this region and no approximate 10 year fluctuations. Perhaps we are again switching regimes.

8. Have you used medians as opposed to means in the analysis? (as averages are sensitive to extremes).
   Response: Not much difference if means or medians are used.

9. Is NAO index weighted in any way?
   Response: Index is the difference of sea level pressures in the winter (December, January, February) between Azores and Iceland.

10. Does cold weather this year in Europe hold any predictions for us?
    Response: The temperature relationship between Greenland and Europe has been known for 200 years, i.e. when its colder in Europe, it will tend to be warmer in Labrador sea with less ice.

11. Last year's report indicated an intrusion warm water into the Bay of Fundy, what is the status of that?
    Response: Evidence of former intrusion of warm slope water is still there. Warm water brings in more salt water. In 1996 seeing more fresh water in the bay, indicating reduction in slope water influence, however. May be due to higher runoff from St. John and other rivers. Limited data suggests most regions of Gulf of Maine still appear relatively warm.

ENVIRONMENTAL CONDITIONS

Marine Environmental Conditions

12. As the 4°C water line moves north in the Labrador Sea, do we see an increase in salmon production?
    Response: If there's an increase in habitat available for salmon, it has been suggested that there may also be a decrease in competition, an increase in available food supply and therefore an increase in production, at least in the short term. Implies some sort of direct relationship.

Recommendations

1. N/A

Fisheries Management Advice

1. N/A

DATE: February 7, 1997

STRIPED BASS

Southern Gulf

Rapporteur:	**Gary Atkinson**
Working Paper Title:	**Striped bass Southern Gulf**
Author(s):	**Gerald Chaput and Rod Bradford**
Referees:	**Brian Jessop** **Peter Cronin**

Introduction:
The Southern Gulf of St. Lawrence is currently the principal area of wild striped bass production in New Brunswick. Gulf striped bass are genetically distinct from Bay of Fundy fish and are considered to comprise a single biological unit. The stock spawns predominantly in the Northwest Miramichi River estuary but is highly migratory, ranging from Percé, Québec to Margaree River, Nova Scotia. This is the first year of assessment since effective regulations have been put into effect to regulate the harvest of striped bass.

Concerns:
Referees:
1. The title does not reflect that the assessment deals primarily with the stock in the southern Gulf.
2. It would be useful to include a table of bass harvest from 1917 to 1975.
3. If the data is available, an examination of temperature related winter mortality, and growth rate relative to temperature would be valuable.
4. Concern was expressed that non-randomness in the sampling of by-catch in gaspareau traps might adversely affect estimates of spawner abundance.
5. It was felt that by-catch of bass was unnecessarily high because fishers didn't exert enough effort to sort catches.
6. Allocations to First Nations on the basis of individual communal needs was considered to be too vague, and amenable to manipulation.
7. An examination of a potential relationship between growth rate and estimates of young-of-year densities was thought to be worthwhile.
   It is not clearly stated what factors could contrive to bring about the massive reduction of spawners observed between 1995 and 1996.
9. A definition of "stock recovery" should be included.
10. Concern was expressed that juvenile abundance as estimated from by-catch in smelt traps appears to be biased against one-year-olds, due to trap selectivity.

Others:

STRIPED BASS

Southern Gulf

1. If the spawner reduction from 1995 to 1996 was due to unreported by-catch, this could potentially devastate stocks. Suggest regulations to prevent this.
2. Marking bass in Nappan Bay could lead to an underestimate of spawner abundance if stocks are not randomly mixed in the area.
3. Considering that the stocks discussed are at the northern extreme of the range for the species, a statement regarding the expectations for recovery relative to more southerly stocks would be useful.

Recommendations

1. Establish baseline spawner abundance for regulation and development of recreational fishery and for development of conservation requirements.
2. Confirm the hypothesis of a yearclass failure in 1993.
3. Estimate the abundance of the female component of the spawning population.
4. Extend migration/stock structure studies to 1997.
5. Assess spawning success in the Miramichi in 1997 given the expectation that female abundance has declined since June 1996.
6. Assess the relationship between pre-winter abundance and body size, and post-winter survival.
7. Extend the back-calculation analysis to the 1994 to 1996 yearclasses to confirm the observed relationship for the 1991 to 1993.
8. Examine yearclass strength in relation to temperature for 1990 to 1996.

Fisheries Management Advice

1. The abundance of female spawners is at risk of a continued decline through to May 1998. Measures to deter poaching and to further reduce or eliminate fisheries induced mortality are to be encouraged. Conscientious angling practices (hook and release techniques) should be promoted throughout the southern Gulf of St. Lawrence. Current status of stocks information should be communicated to all parties (First Nations, commercial fishers, recreational fisheries) for improved collaboration towards effective conservation measures.

DATE: 6 February 1997

ATLANTIC SALMON

Restigouche SFA 15

Rapporteur: **Fran Mowbray**

Working Paper Title: **Status of Atlantic salmon in the Restigouche River in 1996**

Author(s): **Andrea Locke, R. Pickard, F. Mowbray, G. Landry, A. Madden, and E. LeBlanc**

Referees: **Fred Whoriskey**
Carolyn Harvie

Introduction:
The main problems identified in stock assessment procedures for the Restigouche River include: consistently biased (high) estimates of returns by the mark-recapture experiment (Morrissey Rock tagging trap), a lack of estuarine harvest data from Listuguj First Nation, and high levels of poaching (Upsalquitch). Spawning escapement in 1996 was estimated using a range of angling exploitation rates (0.3-0.5). Angling harvest reports on the Restigouche are felt to be the most complete in the province since much of the water is owned or leased by private fishing camps. Spawning escapement calculated in this fashion was in good agreement with abundance estimates from other sources (diver surveys and fence counts). This assessment also includes a preliminary study using mark-recapture type techniques (streamer tags) to evaluate bias in diver counts which are recommended as an alternative assessment technique.

Concerns:
Referee #1 Fred Whoriskey

1. Listuguj harvest is a significant component of river harvest of large salmon. Without Listuguj harvests would returns meet conservation requirements?
2. Has there been any change in aboriginal peoples' harvest? Include recommendations with regard to control of effort in freshwater portions (Upsalquitch).
3. Examine annual variation in juvenile densities, both within the system and in other systems (Catamaran). Use this information to test assertion that poor densities in 1996 are a result of unusually high over-winter kills.
4. Document (tabulate) biological characteristics obtained from fish sampled from gillnet catch at Eel River Bar.
5. Search out alternative methods for getting catch statistics from Listuguj. Also underline Listuguj initiatives to date with regard to conservation policy (effort restrictions and enforcement).
6. Visual count on entire system will be needed if not using trapnet mark-recapture to evaluate returns.

Referee #2 Carolyn Harvie

ATLANTIC SALMON

Restigouche SFA 15

1. Check calculation of egg requirement, Referee could not recalculate requirement with the values given in the text.
2. Add figure with cumulative catch at Upsalquitch fence to discuss inter-annual changes in timing.
3. Discuss why canoe counts are not considered to be reliable. Add appropriate citations.
4. Expand on fudge-factor used to extrapolate diver count to whole system.
5. Clarify the purpose of the diver count experiment, the purpose was not as stated in first sentence of description.
6. Try other forecasting methods (e.g. small to large), also bring in juvenile data where possible.
7. Evaluate the performance of 5 year mean as forecasting model.

Others:

1. Examine discharge or mean site area as a source of variation in juvenile density.
2. State that there was no problem with furunculosis and tagging mortalities in 1997.
3. Check water temperature range used in the calculation of hook and release mortality rates.
4. Include electrofishing data from Irving project.
5. Compare performance of mark-recapture model against some standard. Is it really any worse than the other methods? Do we have any way of quantifying this?
6. For 1997, evaluate tag loss and tagging mortality by holding tagged fish at hatchery.
7. Validate assumptions used in diver counts (mark-recapture) techniques. Did last years experiment test the probability of seeing (recapturing) fish with tags or the probability of seeing all fish (tagged or not). Identify constraints (pool size, observer variance).
8. Incorporate CPUE of anglers or trapnets as an index of abundance.
9. Try diver counts with streamers where abundance is known. Use a stratified survey design.
10. Break Restigouche returns (assessment) into tributaries as much as possible. Look at differences in the biological characteristics and management strategies among tributaries.
11. Identify the amount of hatchery contributions in relation to wild stocks, also when/where stocked.
12. Investigate variation in exploitation rates as a result of angling (water) conditions. Is one exploitation rate more appropriate for 1995 and another for 1996?
13. Check for discharge information from Atholville mill.
14. Interpret juvenile data more - levels are improved but are they at conservation? Revisit what levels we should expect considering stream order, gradient, survey design etc. Compare with Quebec Rivers.
15. Revisit electrofishing sampling design, examine juvenile densities in relation to habitat loss or gain.

Recommendations

1. Move toward a tributary specific approach for assessment and management.
2. Evaluate assumptions in diver (mark-recapture) assessment techniques.
3. Evaluate performance of forecasting model.
4. Examine effect of water levels (temperatures) on juvenile densities.

ATLANTIC SALMON

Restigouche SFA 15

Fisheries Management Advice

1. The level of precision in estimates do not allow us to conclude that conservation requirements were exceeded in 1996. Conservative estimates indicated that they were approached. All estimates indicate that small salmon spawning escapement exceeded conservation requirements.
2. There is no indication that salmon returns in 1997 will be any better than the previous five years. Large salmon spawning escapement has not exceeded requirements in any of these years. In some of these years returns are believed to have exceeded conservation requirements but in all years exploitation of large salmon reduced spawning escapement to a point below or just meeting requirements.
3. Current fishing mortality of large salmon should not be increased in 1997. Adjustments to current fishing seasons to ensure that spawning fish are not being fished on gravel bars are recommended.

DATE: February 10, 1997

ATLANTIC SALMON

Nepisiguit and Jacquet SFA 15

Rapporteur: **Russell Pickard**

Working Paper Title: **Status of Atlantic salmon in the Nepisiguit and Jacquet rivers, New Brunswick, in 1996**

Author(s): **Locke, Andrea, Fran Mowbray and Alan Madden**

Referees: **Francois Caron**
Bill Hooper

Introduction:
An active salmon stocking program has been carried out in the Nepisiguit River for the past two decades, initially to restore the population and subsequently for enhancement purposes. In order to minimize losses of the existing wild salmon population to poaching, a barrier fence has been operated on the Jacquet River since 1994.

Concerns:

Referees:
Nepisiguit:
1. Recheck FISHSYS data (particularly 1995).
2. Should conservation requirement (2.4 eggs/m^2) be achieved before exploitation is considered?
3. There should be a management plan (4-5 year) for stocking requirements developed in order to justify the numbers of fish collected for broodstock. Why not take more grilse for broodstock?
4. Large fish collected for broodstock by electrofishing may be injured.
5. Densities of juveniles should be included in a table; also include PHS values.
6. Include some bench marks on mergansers (Elson's levels) in order to address the concerns about their present levels.
7. Installation of thermographs so the effect of water temperature on juvenile and adult survival may be appreciated should there be a fish kill..
8. The presence/absence of pollution problems in 1996 should be included.
9. Revisit the effect of winter flow rates on juvenile survival.
10. A table showing the breakdown (above/below falls) of stocking should be included.
11. Habitat survey requires revisiting.
12. Effect of hatchery releases on subsequent wild and hatchery survival should be researched by a university student.
13. Since everything is linked to angling catch above the fence, the origin of these angling numbers should be expanded as there is quite a contrast in the sets of angling numbers shown in the tables.

ATLANTIC SALMON

Nepisiguit and Jacquet SFA 15

14. The sex ratio of older fish suggests that the third peak in the length-frequency figure includes many previous spawners, not just 3SW maidens - check length at age.
15. There should be recognition of at least three stocks (main, Pabineau and Gordon Meadow) in the Nepisiguit.

Jacquet:

1. Source of angling data should be given.
2. Is the releasing of small salmon (only) through the season favoring the late run?
3. The reason for the change in the fecundity relationship should be expanded.
4. DNRE electrofishing data should be included in assessment documents.

Others:

Nepisiguit:

1. Why were 1 year old smolts released as opposed to 2 year old smolts?
2. Avoid the use of estimated weights in fecundity relations if actual weights are available.
3. Recheck the discrepancy between juvenile densities and egg deposition levels.
4. The fact that angling statistics and a fixed exploitation rate of 15% was used to calculate returns in years where fence count was estimated from angling statistics should be emphasized.

Jacquet:

1. Has the retention of salmon at the barrier fence reduced the range of spawning sites used?
2. Recent returns in the Jacquet don't seem to support the perception that this river was highly poached prior to operation of the fence.

Recommendations

Nepisiguit:

1. Re-evaluate the habitat survey data.
2. Bring in stock recruitment relationship.
3. Develop a stocking plan.
4. Run the fence for the whole season (if possible) in order to obtain more concrete numbers of returns.

Fisheries Management Advice

1. The Nepisiguit River has not met the conservation requirement in recent years and is not likely to meet it in the immediate future; therefore a precautionary approach of no change in exploitation should be taken.
2. The Jacquet River did not meet the conservation requirement for the first time in three years. It is unlikely that the requirement will not be met in the immediate future; however for biological reasons (spawning may already be underway) an earlier season closure (October 15th) is supported. If there is an exploitation after October 15th it should be restricted to the lower section.

DATE: February 10, 1997

ATLANTIC SALMON

Miramichi SFA 16

Rapporteur: **David Moore**

Working Paper Title: **Atlantic salmon Miramichi**

Author(s): **Gérald Chaput**

Referees: **Francois Caron**
Rick Cunjak

Introduction:
The Miramichi River system supports the largest population of Atlantic salmon in North America. The salmon are composed of several stocks which exhibit two run times (early and late). The river has two main branches, the Northwest and Southwest Miramichi rivers which share a common estuary which drains into the Gulf of St,. Lawrence. Annual assessments of salmon have been done for the Miramichi since 1982 and assessments of the two major tributaries have been done since 1992.

Concerns:
Referees:

1. Angling harvests for 1996 were unknown. Although only small salmon can be harvested by anglers and small salmon make little contribution to egg depositions, angling harvests are not insignificant (10,000-30,000 fish) and need to be documented.
2. Some of the methodology needed to be more thoroughly explained, in particular the 3 mark recapture models and the calibration of open versus closed juvenile density techniques.
3. The document is long and complex. A diagram or flow chart of the steps involved in the assessment should be provided to guide readers.
4. An appendix table showing the detailed juvenile survey results by sites should be provided. Also, where possible juvenile surveys should be conducted during September to decrease temperature stress and provide length data at the end of the growing season.
5. Extensive use has been made of text tables. The information in these tables is sometimes lost to the reader because they do not have titles. Most of these tables should be given a number and title.

Others:

1. Recaptures in Greenland should be noted with a statement indicating that the Greenland fishery was reopened after being closed for two years.
2. The long term outlook for the Miramichi should be more clearly stated.
3. Studies indicating that there are separate early and late run populations need to be referenced.
4. The value and limitations of the PHS index need to be explained.

ATLANTIC SALMON

Miramichi SFA 16

Recommendations

1. Analysis of fecundity data from the Miramichi SEC should be completed and evaluated for use in future assessments.
2. The concern that the LSW Miramichi River salmon population is more depleted than others within the watershed should be addressed.

Fisheries Management Advice

1. Risk analysis estimates the probability that conservation requirements will not be met in 1997 at 27.5% if allocations are the same as in 1996. Risk estimates can be calculated for alternate harvest levels.

DATE: February 10, 1997

RAPPORTEUR REPORT

ATLANTIC SALMON

Buctouche SFA 16

Rapporteur: **Mark Hambrook**

Working Paper Title: **Atlantic salmon Buctouche**

Author(s): **Gary Atkinson, John Peters, Vince LeBlanc, Gilles Cormier and Marie-Josée Maillet**

Referees: **Rod Bradford**
Tim Lutzac

Introduction:
The Buctouche River contains a spawning run of Atlantic Salmon which is exploited by anglers and by the Buctouche First Nation. The stock on this river has been assessed since 1993 using a mark and recapture experiment in co-operation with the Buctouche First Nation and the Southeastern Anglers Association. Conservation requirements have not been met on this river since 1993 and given current trends is unlikely to meet conservation targets in 1997.

Concerns:
Referees:
1. Since the conservation requirement is based on MSW salmon and there is little egg deposition from 1SW fish, the use of an obsolete number for the 1SW conservation requirement is questionable and needs to be re-examined..
2. The need to maintain sufficient 1SW males to maintain a 1:1 sex ratio in spawning escapements is questionable and also needs to be re-examined. Concern that the time of operation of the counting fence may not represent an eventime series.
3. Concern that the time of operation of the counting fence may not represent an eventime series.
4. Concern re methodology of tagging: Only large salmon were tagged, and the assumption is made that grilse and salmon are equally catchable.
5. Concern over continued harvest when conservation requirements are not met.
6. Concern whether trapping operations will continue to run.
7. Telephone survey of anglers could be upgraded to get catch/unit effort data.
8. Give estimate of benefits of enhancement program.

Others:
1. Concern that collecting small numbers of broodstock may compromise genetics of the stock.
2. If grilse runs are overestimated then sex ratio of 1:1 for spawning may not have been met.

RAPPORTEUR REPORT

ATLANTIC SALMON

Buctouche SFA 16

Recommendations

1. Try to tag both large and small salmon for mark/recapture experiment.
2. Outline stocking objectives.

Fisheries Management Advice

1. Conservation requirements were not met in 1996.
2. Based on history, returns in 1997 are not expected to meet conservation targets for large or small salmon.

DATE: February 6, 1997

ATLANTIC SALMON

Prince Edward Island SFA 17

Rapporteur: **Randy Angus**

Working Paper Title: **Atlantic salmon Prince Edward Island**

Author(s): **David Cairns**

Referees: **Kevin Davidson**
David Groman

Introduction:
Salmon, historically abundant in Prince Edward Island, were eliminated from most streams following European colonization. Since the mid-1980's enhancement and stocking efforts have re-established salmon runs on several PEI rivers, particularly the Morell. Other enhanced rivers include Valleyfield, Mill, Dunk and West Rivers. Total conservation requirements based on 2.4 eggs m-2 of river area are 537 large salmon and 288 small salmon for these 5 enhanced salmon rivers on PEI. This includes 159 large salmon and 85 small salmon for the Morell.

The Morell River is reported to have met conservation requirements, while the other surveyed rivers fell short of meeting requirements.

Concerns:
Referees:

1. The fish estimate of 1900 fish for the Morell River is questioned. Suggested that fish may ascend river before trap installation. This, combined with the disproportionate redd counts above and below the trap, makes numbers suspect.
2. The same correction factor for fish leaking through trap should not be applied equally for large and small salmon. As well fish will not ascend the river at the same rate during the low water events in the summer
3. In the five experiments to test smolt trap efficiency, the range of percentages is quite wide.
4. Fish need to be counted out of Mooney's Pond. In the light of hatchery divestiture it will be necessary to maintain some control over releases.
5. There is a need for research to look at egg deposition and wild survival. Why are the numbers so low?
6. There is no biological data collected at the trap. It is a good opportunity to get scale samples, weights, and lengths
7. Seining pools at various times and locations would be a good way to apply tags for capture recapture estimates.
8. A "river" in PEI is quite different from rivers in other areas in the Maritimes. They are physically and biologically different. Therefore, the same yardstick (2.4 eggs m-2), is inappropriate and should not be applied.

ATLANTIC SALMON

Prince Edward Island SFA 17

9. Specific problems in PEI, relate to geology and land use practices, create specific problems for salmon enhancement and therefore assessment .

Others:

1. Are redds counted actually salmon, or could they be attributed to trout?
2. Lack of marks on fish found below Mooney's pond could be due to lack of dye persistence..... Fish should be anesthetized and the marks placed on pectorals and belly.
3. Could leakage from Mooney's pond contribute to the high number of parr below Mooney's? Fish should be checked for adipose clips.
4. Wild survival could be low because of lack of habitat and winter conditions.

Recommendations

1. Concentrate on determining the cause of leakage at trap on Morell.
2. Conduct research into wild survival .
3. Continue to collect data that will allow for an adjustment of the 2.4 m-2 yardstick

Fisheries Management Advice

1. The Morell River, the principal salmon stream on PEI depends largely on hatchery-reared fish for its adult runs. For this reason, and because escapements appear to exceed presently defined conservation requirements, no change to current management is recommended.
2. In general, on PEI, rivers depend heavily on stocking and very little on angler exploitation. No change is recommended to current management.

DATE:February 6, 1997

ATLANTIC SALMON

North Shore Nova Scotia SFA 18

Rapporteur: **Dave Longard**

Working Paper Title: **Atlantic salmon North Shore Nova Scotia**

Author(s): **Shane O'Neil**

Referees: **Chuck Bourgeois**
Nancy Adams

Introduction:
This group is composed of about 15 salmon stocks occupying rivers entering the Northumberland Strait on the north shore of mainland Nova Scotia. The stocks are characterized as mixed large salmon and grilse runs with big fish predominant in fall returns to freshwater. In 1996, most rivers in this area have met or exceeded required spawning escapement. Concern was expressed over the escapements in South River, Antigonish and Wallace River which did not appear to meet required spawning escapements.

Concerns:
Referees:

1. The report would be improved by the addition of some form of executive summary in tabular form. This would save the reader time in flipping back and forth among tables. The summary should include (for each river in the area) habitat areas, stock parameters, juvenile densities, angling catches, egg and adult requirements, capture rates and forecasts. Various scenarios should be shown, since a number of the estimates are quite sensitive to the input variables. These scenarios should include estimates based on high and low estimates.
2. There is much less information available for this SFA in comparison to SFA 20, but I think the managers would have an easier job deciphering the reports if there was some sort of standardized format, I prefer to see the report organized by river as in Area 20.
3. Page 4 - There is concern that the increased catches could be largely an artifact of earlier run timing in 1996 compared to earlier years (in fact the authors refer to the high discharge on page 14).
4. Also, on this habitat issue, there is no mention of the orthophoto method used elsewhere. Why is this? Estimates of spawner requirements should be compared using all available methods and habitat estimates, unless there is clear justification for the use of one method.
5. Is it not possible to calculate confidence limits on the estimates of juvenile densities?
6. Is poaching a justification for restricting harvest on these rivers? It seems the authors are afraid to actually state that based on the estimates, all but two rivers have surplus large salmon that could be harvested by anglers.
7. What percentage of the large salmon are repeat spawning grilse? If this is significant then more emphasis could be placed on protecting virgin grilse (small salmon).

ATLANTIC SALMON

North Shore Nova Scotia SFA 18

8. The capture rate in the angling fishery would affect estimates of returns to the river if there was a high rate of multiple captures of the same fish.
9. It was suggested the author further explain and justify the methods of area calculation for rivers based on ratios of River Philip and South River.
10. If the Wallace River is underpopulated with respect to Elson's norm, does this mean that the West River, Antigonish is overpopulated? If so, what are the implications of this for both the concept of Elson's norm and harvest of salmon on overpopulated rivers?
11. It was questioned as to why 5% mortality was used for catch and released fish as opposed to the 10% used on Eastern Shore Nova Scotia Rivers. The author explained that hook and release mortality would be lower on late run stocks, with cooler water temperatures than on summer catch and releases at times of higher water temperatures.
12. Concern was expressed with respect to the application of marks to adults in the recapture study and whether they are randomly distributed at spawning time. This could lead one to mark fish in areas of high concentration of adults that are not randomly distributed and a high portion of the population is marked. This may be borne out by the high capture/angling exploitation rate. Are there multiple recaptures of MSW adults in the angling fishery suggesting that the fish are concentrated in certain areas, thus making them more vulnerable to angling. If this is so, the assumptions of mark and recapture may not have been met. The author indicated fish were actively moving throughout the river during the survey and the above is not a concern
13. Some discussion of the overall egg deposition of these late run stocks may be warranted as they would have been impacted by the Newfoundland commercial salmon moratorium.

Others:

1. Concern was expressed over whether or not the mark and recapture estimate on River Philip and East River are minimum due to the amount of area included in the survey. If this is true, then the total returns might have been much higher; therefore, catch efficiency was falsely inflated and estimates of returns to rivers using this inflated catch efficiency may be misleading.
2. It was suggested the methodology in mark and recapture snorkel surveys be changed so that observers keep separate records; therefore, calculations would be based on replicates, and as well, provide an individual's observation error.
3. All the area in a river is not equal in terms of its potential to grow salmon during the freshwater stages of its life cycle. Perhaps the different areas could be ranked according to habitat suitability and apply various rates of required egg deposition rather than the blanket application of 2.4 eggs per m^2 .
4. There appears to be an excess of females on some of these rivers. This should be monitored in future years.

Recommendations

1. More biological characteristic data should be collected for rivers in this area.
2. Work toward improving habitat area estimates.

ATLANTIC SALMON

North Shore Nova Scotia SFA 18

3. Look at juvenile sizes after growth season to see if there is density dependent growth effect.
4. In future years, if data in this area is not available, to calculate exploitation rate, the Margaree rate, if available, could be used effectively.

Fisheries Management Advice

1. Forecast returns in 1997, based on 5-year average returns, indicated that spawners (grilse and large salmon) exceeded requirements on the three principal rivers in the area, East, Pictou; River Philip; and West, Antigonish. Juvenile density data indicates returns on West River, Antigonish, relative to conservation requirements, will exceed those on the other rivers in the area.
2. Uncertainty exists in the return estimates based on angler catch data for Wallace River and South River, but low estimated escapements support the use of caution regarding allowable harvest and there should be no directed harvest of MSW salmon in 1997.

DATE February 7, 1997

ATLANTIC SALMON

Cape Breton SFA 18 (part) & SFA 19

Rapporteur: **Paul LeBlanc**

Working Paper Title: **Atlantic salmon Cape Breton**

Author(s): **Larry Marshall et al.**

Referees: **Alyre Chiasson**
Etienne Prevost

Introduction:
Stock assessments for five Cape Breton Island rivers are reviewed. Mark and recapture techniques were used to assess returns on Margaree, Middle, Baddeck and North Rivers. Grand River was assessed using partial counts at a fishway. Conservation requirements in 1996 were met or exceeded on the Margaree, North and Grand Rivers. Requirements were probably met on the Middle River but not met on the Baddeck Rivers.

Concerns:
Referees:

1. Is it advisable to hint at improvement in future marine survival?. How will managers react to this information?
2. Why is the Ricker model still being used when it does not seem to be appropriate?, does it indicate a problem with our analysis of our evaluation of the carrying capacity of the habitat and subsequent marine survival?.
3. Should we be collecting biological information where needed to estimate precise egg deposition. How does it affect our assessment by not doing so?.
4. Middle river has no biological characteristic data.
5. The result of Dodson and Colombani (1996) suggest no genetic difference in early and late run. Why is early and late run still a management concern?.
6. Current management practices such as selective harvesting may tend to push the stock composition in directions which are contrary to environmental conditions. For conservation purposes, we should recommend removals to reflect current natural composition of stocks.
7. In the case of the Margaree River, is there a need for enhancement since conservation has been exceeded over the past decade?.
8. Should standardize juvenile sampling (e.g. removal vs. mark-recapture). CPUE approach be explored.
   Should be some clarification on what Elson's "normal abundance index" means. Should another indicator such as PHS be used?.
9. Do swim-thru visual counts give an over-representation of marked fish as marked fish may be seen more easily do to colored tags.?

ATLANTIC SALMON

Cape Breton SFA 18 (part) & SFA 19

10. Uncertainty on the measure of the size of the recapture (counted) sample should be accounted for in the estimates provided. Is it possible to stratify spatially the mark and recapture experiment?
11. Pooling visual counts may risk biased estimates.
12. Hatchery stocking on the Margaree seems to produce more 1SW than MSW, this is contrary to the natural composition of the stock. Such is the case in other Cape Breton rivers, stocking mainly produces 1SW returns which in turn contribute very little to increase in "wild" recruitment.
13. Does the Chi-square analysis support pooling Lake O'Law fence and fall seining data?.
14. Forecast returns for the Margaree are based on one point estimate derived from the average stock recruitment relationship. Should incorporate uncertainty around the mean relationship as proposed for the Miramichi.
15. North river fall swim-thru does not allow for streamer tags which were applied during the summer swim-thru. Tags available may be incorrect, thus biasing population estimate.
16. Should provide confidence limits on bi-pass rate for Grand river.
    Estimates of 0+ densities may be biased by applying same efficiency from capture rates for parr.

Others:

1. Levis trapnet could be used as an index of returns to the Margaree by applying trapnet efficiency.
2. There is a general perception that overall abundance of salmon is greater than what is actually out there.

Recommendations

1. Should allow rivers such as Margaree to exceed the 2.4 eggs per sq. meter conservation level and use as a study area.

Fisheries Management Advice

1. Returns to Margaree, North, Middle and Grand rivers in 1997 will meet or exceed conservation requirements. Requirements will not be met on the Baddeck Rivers.
2. There is little expectation that the level of returns to the rivers of Cape Breton and Richmand counties will differ from the level forecast for Grand and Baddeck Rivers.

DATE: February 10, 1997

ATLANTIC SALMON

Eastern Shore Nova Scotia SFA 20

Rapporteur: **Trevor Goff**

Working Paper Title: **Atlantic salmon Eastern Shore Nova Scotia**

Author(s): **Shane O'Neil**

Referees: **Fred Whoriskey**
Nancy Adams

Introduction:
Salmon Fishing Area 20 (SFA 20) is located on the eastern shore of Nova Scotia between the city of Dartmouth and the causeway across the Strait of Canso (Gig. 1). Historically, Atlantic salmon anglers have fished as many as twenty-nine rivers on the eastern shore. More recently, however, less than 20 rivers have been fished with any regularity (Table 1).

This document summarizes information relevant to the Atlantic salmon stock status for rivers within the eastern shore area. Particular attention is paid to the (arranged alphabetically below) East Sheet Harbour, Liscomb, Musquodoboit, St. Mary's, Salmon Guysborough and West Sheet Harbour rivers.

Many of the rivers in SFA 20 are acid stressed (Table 2). The acidification of some rivers has resulted in partial, or in at least one case, the Tangier River, total loss of the salmon production potential.

Concerns:
Referees:

1. Please elaborate on the precision and accuracy of the N.S. salmon angler catch reporting system. How good are the present data, given the problem with anglers catch and release fishing for salmon using trout licenses.
   Response: This was taken into account, but there is concern that accurate data are being lost. This was a concern at a recent management meeting, and a solution is being sought.

2. Has any progress been made in the review of the conservation requirement for the Liscomb (an acid-impacted river), an ongoing objective of the past several years. A conclusion to this review would be appreciated.

3. Why was stocking only in the East branch, St. Mary's River.
   Response: The objective was to shore up the 3SW component, but 3SW returns became so low due to marine conditions, that broodstock collection became impractical and undesirable.

4. Could parr differences between years have been distorted by hatchery parr stocking.

ATLANTIC SALMON

Eastern Shore Nova Scotia SFA 20

5. What caused the distortion of the in-season estimate using the client-based two pool estimate? Are the fish holding there and being caught more than once, biasing the estimate? There is a potential client conflict that should be avoided if possible.

6. In the acid-stressed rivers that are 100% supported by hatchery stocking, what will be DFO's obligation to these rivers after the divestiture of the hatchery operations to clients.
   Response: DFO intends to continue the evaluation process.

7. License stub data represent 40% of returns. These data were extrapolated using returns from earlier years. Is there any evidence to suggest that those assumptions are no longer valid? e.g. only one retention fishery in Area 20 in 1996 may have affected the stub returns.

8. Is it possible to estimate "acid impacted" salmon habitat to yield a more realistic spawner requirement for afflicted rivers.

9. Would the time period between marking and recapture affect estimates on the Musquodoboit fish?

10. Is there an estimate of the proportion of hatchery fish in Musquodoboit River adult returns? Would this affect estimates of conservation requirements. The concern is that catches could diminish if the hatchery program is reduced.
    Response: Anecdotal (fishery officer) estimates hatchery returns are 30-40% of angling catch.

11. The analysis of differences in parr densities among tributaries and main stems of the two boundaries of the St. Mary's seems somewhat contradictory. What interpretation should be given to the significant difference between 1+ parr densities and the absence of any difference for total parr.

Others:

1. What % of hatchery fish are in the St. Mary's returns?
   Response: No data available, although in 1996 catch was up (a typically) in the East Branch, possibly a reflection of the 1995 smolt stocking. It was suggested that due to potential 1997 hatchery returns from both 1993 fall and 1995 spring stocking, that this could be assessed in 1997?

2. Are the pH values the lowest recorded or the means?
   Response: The data reported are point, episodic data.

3. Should the St. Mary's assessment be based on the LaHave exploitation rate:

ATLANTIC SALMON

Eastern Shore Nova Scotia SFA 20

4. SFA 20 rivers are all below the conservation requirement. It was felt that this could be an indicator of similar conditions in SFA 21. A further look at links between the zones could be useful.

5. could a comparison be made between the mark-recapture and the exploitation rate methodology for the musquodoboit?

6. If there is no recreational fishery, does assessment data become weaker?

7. Could the in-season forecast at Morgan Falls be used to determine opening or closing of the St. Mary's River?

Recommendations

1. The review of the conservation requirement for Liscomb river should be completed.
2. There is a requirement to collect more biological data for the Salmon River Guysborough County.
3. Research requirements: 1) What are the adult stock numbers and composition in the St. Mary's and 2) Why are the juvenile recruitment levels lower than expected in the St. Mary's river?

1997 Forecasts

	Conservation Requirement	
River	MSW	Grilse
St. Mary's	<	<
Musquodoboit	<	<
Salmon	<	<
Liscomb	<<<	<<<
East S.H.	N/A	N/A
West S.H.	<<<	<<<

Fisheries Management Advice

1. St. Mary's River did not meet the conservation requirement in 1996 and is not expected to in 1997 for grilse or 1 MSW salmon.
2. Musquodoboit River did not meet requirements in 1996 and even with stocking of 21,800 smolts in 1996 is not expected to meet grilse or MSW salmon requirements in 1997.
3. Salmon River, Guysborough, would not have met requirements in 1996 and based on similarities in catch profiles with the St. Mary's River will not reach conservation requirements in 1997.
4. Liscomb River returns of wild fish were the lowest of the time series in 10996. MSW returns

ATLANTIC SALMON

Eastern Shore Nova Scotia SFA 20

in 1997 are forecast to be well below the requirement.

5. West River S.H. should remain closed because of critically low returns.
6. East River S.H. - No conservation concern; harvest OK.
7. Other systems acid stressed and expected to be below requirements in 1997.

DATE: February 7, 1997.

ATLANTIC SALMON

South Shore Nova Scotia

Rapporteur: **Eric Jefferson**

Working Paper Title: **Atlantic salmon South Shore Nova Scotia**

Author(s): **Peter Amiro**

Referees: **Rod Bradford**
Chuck Bourgeois

Introduction:

Salmon Fishing Area (SFA) 21 includes 16 rivers , many of which are acid impacted and have hydroelectric developments. Counts at the Morgan Falls fishway, on the LaHave River provide an index of returns to rivers in SFA21.

Concerns:

Referees:

1. A table of impacted rivers in SFA21 should be included in the document.
2. Previous years forecast should be used to weight the in-season estimates.
3. What contribution do hatchery returns make on future wild population estimates?
4. Given the variability of catches among rivers in SFA21 can the LaHave be used as an index?
5. Fallback rates at Morgan Falls should be identified .
6. Mortality rates for smolts at the Morgan Falls Power Development should be defined.
7. Radio tag experiment should be repeated.
8. Are capture rates of hatchery and wild smolt the same at smolt counting facility at Morgan Falls?
9. The 1983 estuary trapping mark - recapture experiment should be repeated to obtain estimate for the whole river
10. Impacts of the loss of hatchery stocking should be identified and included in the forecast for future years.
11. Tag loss and tag mortality rates should be calculated for the LaHave.
12. In previous years spawner to recruit data was presented but is not brought forward in 1996. Given the lengthy time series of data available with recruit freshwater and sea ages available this warrants further analysis especially with the 1992-1996 returns being as close to the total production as is likely to be measured. This would provide an additional estimate of the future returns especially based on the mean spawner to recruit ratio for the last five years.

Others:

1. Angling exploitation rates should be adjusted annually.
   Due to uncertainty of fall-back rates at Morgan Falls , should fishway counts be used to forecast next years returns above Morgan Falls only and not for the whole river?

Recommendations

1. Conduct estuary mark-recapture study to obtain basin-wide estimate of adult returns to the LaHave River.
2. Determine the fall-back rate at Morgan Falls.
3. Continue Morgan Falls adult enumeration.
4. Enumerate smolt at the Morgan Falls Power generation station and determine turbine mortality rates for wild and hatchery smolt.
5. Electrofishing sites should be redone in 1997 .

Fisheries Management Advice

1. For the LaHave River conservation targets were not met in 1996 and it is unlikely that they will be met in 1997. A catch and release fishery could be conducted until in-season assessments suggest that spawning targets will be met.
2. There should be no increase in exploitation for SFA21, except in those rivers where there is no conservation concern because runs are entirely dependent on hatchery returns.(e.g. Mersey, Clyde).

DATE: February 6, 1997

ATLANTIC SALMON

Inner Bay of Fundy SFA 22 & part of SFA 23

Rapporteur: **Doug Aitken**

Working Paper Title: **Atlantic salmon Inner Bay of Fundy**

Author(s): **Peter Amiro**

Referees: **Allen Curry**
Dave Meerburg

Introduction:
This review covers rivers in the Bay of Fundy beginning east of Saint John at the Black River and extending around the upper part of the Bay to and including the Annapolis River, Nova Scotia. Salmon from these rivers with the exception of Annapolis and Gaspereau river have similar bioligical characteristics, run-timing and life history. These 20-some stocks are collectively referred to as the inner Bay of Fundy stocks. Inner Bay rivers have been closed to salmon fishing since 1989 because of low escapement. The Big Salmon (NB) and the Stewiacke (NS) are index rivers for the inner Bay stocks.

Concerns:
Referees:
1. Inner Bay of Fundy rivers have been shown to have high variability due to sea survival, this should not preclude efforts to continue to assess juvenile stocks and maintain fresh water habitat.
2. The impact of aquaculture stocks on Inner Bay Rivers needs to be assessed.
3. Impacts of cage reared adult stocking of Big Salmon River on sustainability should be evaluated.

Others:
1. The number of extra environmental stresses on stock recovery may mean a much longer recovery period than in the past.
2. Should look at ecological flow pattern changes in the Inner Bay attributed to construction constraints on many rivers and how this effects smolt migration and adult escapement.
3. Concerns were expressed on the method of counting adult returns to Big Salmon River. NB.
4. Concerns were expressed about using electro seine boat counts, based on only two calibrations, as an estimate of adult returns to Stewiacke River.

Recommendations
1. The impact of strategies for adult salmon grow out and stocking must be assessed before being widely applied.
2. Evaluate adult counting strategies on index rivers.

ATLANTIC SALMON

Inner Bay of Fundy SFA 22 & part of SFA 23

3. Knowledge of the migration route and behavior of inner Bay of Fundy post-smolt and salmon would be beneficial to understanding the instability of inner Bay of Fundy salmon stocks.

Fisheries Management Advice

1. Inner Bay Rivers: Little chance of conservation requirements being met in next five years.
2. Low abundance is due to marine survival.
3. Rate and amplitude of any future recovery could be affected by instream alterations of habitat.

DATE: February 5, 1997

ATLANTIC SALMON

Southwest New Brunswick SFA 23

Rapporteur: **Ross Jones**

Working Paper Title: **Status of Atlantic salmon stocks of southwest New Brunswick**

Author(s): **Larry Marshall, Ross Jones, and Tom Pettigrew**

Referees: **Gilles Lacroix**
Allen Curry

Introduction:
The assessment was primarily of the Saint John River Atlantic salmon stocks above Mactaquac dam. It was based on information from the Mactaquac fish counting and data collection facility at Mactaquac dam and hatchery. Also assessed were three tributaries of the Saint John: the Nashwaak River, using data from a counting fence; the Kennebecasis River, also using counting fence data and the Hammond River, using redd counts. Also two rivers which flow into the outer Bay of Fundy; Magaguadavic River (St. George, NB) and St. Croix River (Milltown, NB on the USA/Canada border), were assessed using data from a trap in a fishway.

Concerns:
Referees:
1. Forecasts should have the wild and hatchery component modeled separately.
2. Old area estimates should be tabled along side the new estimates with the percent change.
3. The use of more collective tables would be helpful as some important information tends to get buried in the document.
4. There is a need for an aquaculture escapee policy for the Magaguadavic River.
5. What is the actual contribution of the hatchery?
6. What is known about smolt and kelt movement through dams?
7. Concern about how hatchery return rates are derived and would it be possible to mark all distributions?
8. Why are we stocking the Kennebecasis River?

Others:
1. That wild fish may also have fin deformities and therefore wild returning salmon could be misidentified as hatchery.
2. That the MSW:1SW ratio of hatchery returns from both 1 yr. old smolt and 0+ stocking are different than observed in the wild stock. The hatchery progeny are returning primarily as 1SW salmon.
3. That high redd counts could be related to years with high fall discharge. Higher water levels would tend to get a higher number of spawners into the system.
4. Encouraging to see the 6 week feeding fry program is working well and we should try to preserve the wild and discreet stocks above Mactaquac.

ATLANTIC SALMON

Southwest New Brunswick SFA 23

Recommendations

1. A need for a working group to meet and review existing data and develop a Management Plan for Southwest NB rivers which have aquaculture escapees, specifically Magaguadavic and St. Croix rivers. This Management Plan would include a monitoring and research component.
2. That a risk analysis estimate(s), similar to the one proposed for the Miramichi River, should be investigated for the Saint River stock above Mactaquac.

Fisheries Management Advice

1. That 1SW salmon returns to Saint John above Mactaquac will exceed the spawning requirement in 1997. While the MSW salmon forecasts suggest that returns will not exceed the spawning requirement.
2. None of the remaining stocks assessed in SFA 23 will meet or exceed 1SW or MSW salmon requirements in 1997.
3. That in-season management decisions should be delayed until August 1, when the forecast model becomes a better predictor.

DATE: February 4, 1996

Part II

Consultations

INTRODUCTION

This section of the Report contains the written records of the client consultation meetings held prior to the Peer Review meeting. The purposes of these consultations were to provide a preliminary status report on the stocks to clients and other interested parties, to gather any additional information and insights that they might contribute, and to seek suggestions on how to improve the assessment in the future. Some of these consultations were conducted as science only workshops while others were carried out under broader agendas usually dealing with a wider range of fisheries management aspects. Although there were inconsistencies in both meeting format and written record among the various consultations held, there was general consistency in the coverage of science matters.

STRIPED BASS

1. SPECIES / STOCK:

- Striped bass Miramichi River/Southern Gulf of St. Lawrence

2. ARRANGEMENTS:

DATE: Dec. 9, 1996
TIME: 13:00 to 16:30
LOCATION: Dept. of Natural Resources and Energy, Newcastle, New Brunswick

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC..)

- Science Workshop

4. PARTICIPANTS (Name and Affiliation)

- Normand Allain, Gaspereau fisher (Northwest Miramichi), Richibouctou Village
- Robert Allain, DFO, Area Manager, Tracadie-Sheila
- Don Archibald, MREAC, Miramichi
- Jean-Claude Babineau, Southeast Anglers Association, Bouctouche, N.B.
- Rod Bradford, Rod Bradford & Associates, Mt. Uniacke, N.S.
- Gerald Chaput, DFO Science, Moncton, N.B.
- Harry Collins, MREAC, Chatham, N.B.
- Gilles Cormier, Southeast Anglers Association, Bouctouche, N.B.
- Gaëtan J. Couturier, DFO, Tracadie-Sheila, N.B.
- Junior Denny, Fisheries Coordinator, Eel Ground First Nation, Miramichi
- Brian Donovan, Angler, Miramichi, N.B.
- Bernard L. Dubee, DNRE, Miramichi, N.B.
- David Dunn, DFO Fisheries Management, Moncton, N.B.
- Gerald Dutcher, Gaspereau fisher, Loggieville, N.B.
- Clifford Ginnish, Fishery Supervisor, Eel Ground First Nation, Miramichi
- Mark Hambrook, DFO Science, Miramichi, N.B.
- John Hayward, DFO Science, Miramichi, N.B.
- Firmin LeBlanc, Kouchibouguac National Park, Kouchibouguac, N.B.
- Léophane LeBlanc, Kouchibouguac National Park, Kouchibouguac, N.B.
- Tim Lutzac, DFO Science, Moncton, N.B.
- Alan Madden, DNRE, Campbellton, N.B.
- Marie-Josée Maillet, Southeast Anglers Association, Bouctouche, N.B.
- Eugène Richard, Gaspereau fisher (Northwest Miramichi), Richibouctou Village
- Joe Richard, Gaspereau fisher (Northwest Miramichi), Richibouctou Village
- Daryl Trevors, commercial fisher, Miramichi, N.B.
- Fred Wheaton, New Brunswick Wildlife Federation, Moncton, N.B.

5. NEW INFORMATION BROUGHT FORWARD (what? by who?)

- angling success very good in the fall in Bathurst Harbour for the third year in a row (A. Madden, DNRE)
- rumors of sales of bass prevalent in some areas, especially Richibucto area (J.C. Babineau) egg and larval survey in Kouchibouguac did not find bass in 1996 but juveniles were seined in late summer (L. LeBlanc, Kouchibouguac Park)

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- questions regarding whether angling should be allowed during the spawning season (was to be considered for preparation of management plan)
- was the impact of seals on striped bass being considered? Seal abundance is increasing everywhere (N. Allain). No plans to undertake seal predator studies specific to striped bass. The impact of seals on various fish resources is being studied by others.
- still do not know what the impact of the fall openwater fishery has on the young-of-the-year bass. Is it a small proportion of the total population - if so, may not be a major concern.
- very little is known of the importance of forage species abundance on striped bass, including smelt, sand lance, and invertebrates. No plans to undertake feeding studies of striped bass.

7. RECOMMENDATIONS:

a.) Pertaining to Assessment

- The use of gaspereau traps in the Northwest Miramichi to estimate spawner abundance may be compromised by variations in season openings and effort. The use of alternate sources of data such as the Eel Ground food fishery trapnets should be considered to provide a more consistent measure of abundance (based on catch per unit of effort)

b.) Pertaining to next year's workplans

- continue estimation of spawner abundance and YOY index in openwater fishery to determine the extended contribution of the 1991 year-class
- with the collaboration of user-groups in other estuaries (Richibucto, Kouchibouguac) assess through tagging and monitoring of spawners in the spring whether spawning does occur and in a consistent manner in estuaries other than the Miramichi
- impact of hook and release angling on striped bass should be studied - first through a literature review of studies from the USA and through research initiatives during derbies (should these be developed)

Other Concerns:

Rod Bradford — NAME OF PRESENTER

Gérald Chaput — NAME OF RAPPORTEUR

ATLANTIC SALMON - RESTIGOUCHE RIVER (SFA 15)

1. SPECIES / STOCK:

- Atlantic salmon/Restigouche R.

2. ARRANGEMENTS:

DATE: 7 January 1997
TIME: 0900
LOCATION: Ministere de l'Environnement et de la Faune, New Richmond, Quebec

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC..)

- Restigouche Fishery Science Working Group meeting

4. PARTICIPANTS (Name and Affiliation)

- Andrea Locke (DFO)
- Gilles Landry (MEF)
- Alan Madden (DNRE)
- Ed LeBlanc (DNRE)
- Julie Bourque (DNRE)
- Richard Firth (Comite de Gestion des Rivieres Matapedia et Patapedia)

5. NEW INFORMATION BROUGHT FORWARD (what? by who?)

- Landry/Firth - corrections to Causapscal fence count
- Madden/LeBlanc - updates to N.B. Crown Reserve angling catch
- Madden - comparison of canoe vs. diver counts on Little Main Restigouche

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- concern re removals at Upsalquitch - magnitude of removals (all sources) is unknown, possibility that this is a threat to conservation

7. RECOMMENDATIONS:

a.) Pertaining to Assessment

- accept angling-based estimate of abundance with exploitation rate near 0.3
- comment on size-at-age of Restigouche grilse and salmon relative to other systems, and also with respect to annual changes in Restigouche

b.) Pertaining to next year's workplans

- consider reducing DFO/Eel River Bar F.N. emphasis on Morrissey Rock trapnet and using these personnel to expand electrofishing operations, especially to look at juvenile densities above barrier fences in N.B. and Quebec (NW Upsalquitch, Causapscal, and Little Main)

- evaluate conservation requirement of 2.4 eggs/m2 in Restigouche; Quebec uses 1.68 eggs/m2; what about 4 eggs/m2? - *Working Group willing to support a project on this* subject, could approach this via electrofishing
- there is a need to obtain better data on removals from the Upsalquitch River; not just the native fishery, which has received considerable publicity this year, but also a presumed high incidence of poaching

Other Concerns:
None.

Andrea Locke

NAME OF PRESENTER

Andrea Locke

NAME OF RAPPORTEUR

ATLANTIC SALMON - NEPISIGUIT RIVER (SFA 15)

1. SPECIES / STOCK:

- Atlantic salmon / Nepisiguit River

2. ARRANGEMENTS:

DATE: Dec. 4 1996
TIME: 0900
LOCATION: Dept. of Natural Resources and Energy, Bathurst

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC..)

- Nepisiguit Watershed Management Committee meeting

4. PARTICIPANTS (Name and Affiliation)

- Andrea Locke, DFO
- Bob Baker, Nepisiguit Salmon Association
- Alan Madden, DNRE
- Paul Cameron, DFO
- Danny Surette, ASF
- Rick Schwengel, Brunswick Mining
- Glen Ferguson, Long Run Conservation Group
- Peter Johnson, Nepisiguit Salmon Association
- Marie-Lynn Meurant, Bathurst Sustainable Development Project/N.B. Dept. of Fisheries and Aquaculture

5. NEW INFORMATION BROUGHT FORWARD (what? by who?)

- Juvenile densities, Angler surveys, Merganser surveys, Redd counts - B. Baker
- Broodstock data, Hatchery stocking - P. Cameron

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- grilse are underestimated at fence due to 'leaks' in early season (assessment depends on angling-based 'adjusted' fence count, not the actual fence count)
- high poaching mortalities this year (will consider incorporating a mortality factor)
- difficult to evaluate returns of adipose-clipped hatchery fish now, since few are clipped
- assessment method does not take into account fish which returned after mid-October (assessment is conservative)

7. RECOMMENDATIONS:

a.) Pertaining to Assessment

- should indicate importance of tributaries for spawning relative to main river

b.) Pertaining to next year's workplans

- continue operating fence to get broodstock - electrofishing boat experiment (P. Cameron, C. Wood) was unsuccessful
- measure all broodstock at time of collection

Other Concerns:

- would like to see a salmon stamp program with funding directed to salmon issues
- very concerned about DFO plan to eliminate requirement for tags on aquaculture salmon, this will lead to difficulties in enforcement and identification of poached wild salmon

Andrea Locke

NAME OF PRESENTER

Andrea Locke

NAME OF RAPPORTEUR

ATLANTIC SALMON - BOUCTOUCHE RIVER (SFA 16)

1. SPECIES / STOCK:

- Atlantic salmon, Bouctouche River, 1996

2. ARRANGEMENTS:

DATE: 11 December, 1966
TIME: 1930
LOCATION: Buctouche First Nation Band Office, Bouctouche, NB

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC..)

- Science Workshop

4. PARTICIPANTS (Name and Affiliation)

- Gérald Chaput - DFO Moncton
- Gary Atkinson - DFO Moncton
- Gilles Cormier - Southeastern Anglers Association
- Marie-Joseé Maillet - Southeastern Anglers Association
- Carol Peters - Buctouche First Nation
- Serge LeBlanc - Kent County Trout and Salmon Fishing Association

5. NEW INFORMATION BROUGHT FORWARD (what? by who?)

- Gary Atkinson - Presented preliminary results of 1996 stock assessment indicating returns were well below requirements, and juvenile survey data showing salmonid densities to be low
- Gilles Cormier - Presented details of fall fingerling stocking

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- Installation of mark-recapture facilities was not early enough to sample the beginning of the run. It was agreed that every effort would be made to begin operations at least two weeks earlier in 1997.
- Clients were generally satisfied with the efficacy of the current workshop/consultation process.

7. RECOMMENDATIONS:

a.) Pertaining to Assessment

- Operate at least one estuary trapnet to mark salmon (Bouctouche First Nation) in conjunction with a counting fence upriver as the recapture site (Southeastern Anglers Association). These facilities should be run from the beginning of September to early in November.
- Repeat the juvenile survey to determine the extent of habitat use, validate spawning success, and monitor the survival of stocked fall fingerlings.

b.) Pertaining to next year's workplans

- No significant change from 1996.

Other Concerns:

None.

	Gary Atkinson
NAME OF PRESENTER	NAME OF RAPPORTEUR

ATLANTIC SALMON - NORTHUMBERLAND STRAIT (MAINLAND PORTION OF SFA 18)

1. SPECIES / STOCK:

- Atlantic salmon in the Northumberland Strait area of Nova Scotia (mainland portion of SFA 18)

2. ARRANGEMENTS:

DATE: December 9, 1996
TIME: 6:30 p.m.
LOCATION: Museum of Industry, New Glasgow, Nova Scotia

3. FORM OF CONSULTATION

- Science and management participated in a joint consultative meeting

4. PARTICIPANTS

- Bob Ferguson, President, Pictou County Rivers Association
- Parker Wong, Pictou County Rivers Association
- Benvie Cummings, Pictou County Rivers Association
- Garfield Morash, Pictou County Rivers Association
- Richard Kellock, Pictou County Rivers Association
- Ken Trefry, Pictou County Rivers Association
- Terry MacIntyre, Nova Scotia Salmon Association
- Jason LeBlanc, Nova Scotia Department of Fisheries
- Don MacLean, Nova Scotia Department of Fisheries
- Shane F. O'Neil, Diadromous Fish Division, Science Branch, Fisheries and Oceans
- Carolyn Harvie, Diadromous Fish Division, Science Branch, Fisheries and Oceans
- Warren Parsons, Fisheries and Habitat Management Branch, Fisheries and Oceans
- Leroy MacEachern, Area Managers Office, Fisheries and Oceans

5. NEW INFORMATION BROUGHT FORWARD

- **None.**

6. CONCERNS RAISED BY CLIENTS

- Validity of angling statistics; anglers tasked to communicate need for accurate data to fellow anglers.
- Many anglers did not buy salmon licenses; how can that be corrected? C&P and province will have to discuss this winter - licensing controlled by province.
- Hatchery closures - how can they act to ensure programs such as Middle River do not die in mid-program; No action required, client told to coordinate through NSSA or local association re expressions of interest.
- How can anglers help in assessments or to improve runs? O'Neil to work on list of areas and provide to incoming president of Pictou County Rivers Association by spring 1997.

- Providing list of surplusses may leave rivers vulnerable for additional directed harvest - Is this a good practice? Explained open assessment process is to allow client/co-manager to better understand, contribute, etc. No action required
-

7. RECOMMENDATIONS:

a.) Pertaining to Assessment

- Client advised not to state surplus but to restrict assessment output to having met or not met conservation requirement.
- Want some action taken to improve angling statistics through licensing related to anglers hooking and releasing salmon without a license under the guise of trout fishing so data is not forthcoming from those individuals

b.) Pertaining to next year's workplans

- Provide detailed list of actions that clients can take to contribute to assessments and workplans.
- DFO and province to work out temporary closure of Middle River to angling to allow stocked smolt to migrate from river to headpond.

Other Concerns:

- Client group agreed that rotating the client consultation meeting within the area would facilitate participation from clients from Cumberland and Antigonish counties.
- Poor weather probably prevented many from attending; M. MacAdam from the Atlantic Salmon Federation could not make it, requested the information and will provide comment.

Shane F. O'Neil — Shane F. 'Neil

NAME OF PRESENTER **NAME OF RAPPORTEUR**

ATLANTIC SALMON - CAPE BRETON ISLAND (SFA 18 (part) & SFA 19)

1. SPECIES / STOCK:

- Atlantic salmon, Cape Breton Island

2. ARRANGEMENTS: Eskasoni Fish and Wildlife Commission

DATE: Thurs, Jan 16, 1997
TIME: 1:00 pm
LOCATION: Eskasoni Fish and Wildlife Comm. Office, Eskasoni.

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC..)

- Mini-ZMAC 19 (strictly Science consultation) for aboriginals. Invites and phone calls to each of the five Bands through Charlie Dennis; Dave Fraser (DFO) was main "arranger". Meeting lasted until 3:30 pm

4. PARTICIPANTS (Name and Affiliation)

- Charlie Dennis (Eskasoni FN but "representing FNs" [his words]), Cheryl Berube (Eskasoni FN), Bobby Gould (Waycobah FN), Dave Fraser (DFO Halifax), Gary MacDonald (DFO, Baddeck), Leonard Forsyth (DFO Margaree), Larry Marshall (DFO, Halifax)

5. NEW INFORMATION BROUGHT FORWARD (what? by who?)

- **Charlie Dennis:** not aware of either the numbers of salmon harvested by various Bands, esp. Membertou, or of the results of monitoring the Sydney River fishway (Membertou). (Keith Christmas/Lance Paul never available).
- **Bobby Gould:** 15 grilse and 5 salmon angled from Skye River, another 50 fish taken by spear and lights in the shallows of Wycocomagh Bay.

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- No concerns expressed re: information relevant to data or its use in assessing the stocks.

7. RECOMMENDATIONS:

a.) Pertaining to Assessment

- Charlie to follow up with Membertou re: 1996 activities.

b.) Pertaining to next year's work plans

- Bobby indicated that he would like to see dive counts and electrofishing conducted on the Skye River; Charlie indicated that both could be coordinated through his office.

Other Concerns:

- Will Levi's trap be operated once the Hatchery has been divested? (no direct response but indicate that $ resources may be less in the future and that perhaps there were more

economical methods [juvenile surveys] of keeping the pulse on a stock that had largely exceeded conservation requirements over the past decade)

- Can the electrofishing season be extended? (indicated that fall surveys were not ideal).
- Will recreational interests be requesting retention of grilse in 1997? (Leonard speculated that there would be requests; I concurred that there will be little information to suggest that conservation requirements for grilse will not be met.)
- Costs and potential use of ultrasonic gear to follow the movements of salmon within Bras D'Or [spin off concern from Middle Shoal issue]. (Leonard offered to be a contact if Charlie wanted to pursue the topic further).
- Impact of aquaculture escapees on the Skye River population (we indicated a high probability of impact on the genetics of the "native" stock and that some universities had the technology to quantify [we have scale material prior to the establishment of the aquaculture operation] but wondered about the potential for solutions if the problem was confirmed.)

Larry Marshall

NAME OF PRESENTER

Leonard Forsyth

NAME OF RAPPORTEUR

ATLANTIC SALMON - CAPE BRETON ISLAND (SFA 18 (part) & SFA 19)

1. SPECIES / STOCK:

- Atlantic salmon, Cape Breton Island

2. ARRANGEMENTS: Cape Breton Sport Fishery Advisory Board

DATE: Tues. Dec 17, 1996
TIME: 7:00 pm
LOCATION: Alexander Graham Bell Museum, Baddeck.

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC..)

- Combined meeting of CBSFAC/ ZMAC 19
- Science consultations comprised one agenda item taking (with questions and dialogue) 1.75 hour.

4. PARTICIPANTS (Name and Affiliation)

- Marshall Kaiser (Chair, CBSFAC; Highland Bras D'Or), Jack McKillop (Highland Bras D'Or),
- Hubert Doyle (Richmond Wildlife), Lew Evans & Doug Doyle (North Sydney Wildlife), Kevin Dolhanty and Gordon MacFadden (Bras D'Or Wildlife), David Ross & Larry Forsyth (Margaree
- Salmon Assoc.), Vernon Boone (Port Morien Wildlife), Tom Eavis (North Sydney member-at-
- large?), David Harding (Cape Breton Anglers Assoc.), John Kennedy (NS Wild Federation), Lewis Hinks (ASF), Nancy Adams (NS Dept Fisheries), Gordon Delaney (CBHNP), R.C. Thompson and Florence Mancini (DFO, Sydney), Leonard Forsyth (DFO, Margaree), Warren Parsons (DFO, Antigonish), Paul LeBlanc (DFO, Moncton), Greg Stevens & Larry Marshall (DFO Halifax).

5. NEW INFORMATION BROUGHT FORWARD (what? by who?)

- None relevant to the assessment.

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- forecasts do not include impact of removals in Greenland (minor impact at low quota levels).
- estimates of catch from license stubs are biased by multiple recaptures (agree to some extent).
- estimated returns to North River exceed estimated returns to larger Middle and Baddeck drainages, that is to say, that different drainages might have different production potentials and that 2.4 eggs/m^2 may not be an appropriate requirement for all waters (agreed in principle, but hatchery contribution to North River significantly augmented 1SW returns).
- estimation of late-run stock components to Bras D'Or tributaries and North River may be less complete than are assumed (agreed in principle although probably not of significance in 1996).

- how can Grand River stocks be assessed in 1997 without fishway counts by DFO? (fishway counts could be done by aboriginals, or, backcast from juveniles densities in 1998-99.

7. RECOMMENDATIONS:

a.) Pertaining to Assessment

- None

b.) Pertaining to next year's workplans

- None

Other Concerns:

- no handouts (precise to be provided for CBSFAC "Minutes"); potential for "partnering" with DFO in future assessment/enhancement activities requires consideration before feed-back; prospects for retention of summer-run grilse on the Margaree in 1997 (Manager's discretion) and, utility of in-season assessments if variations to regulations are too expensive for DFO (provide additional insights to run composition).

Larry Marshall

NAME OF PRESENTER

Paul LeBlanc

NAME OF RAPPORTEUR

ATLANTIC SALMON - EASTERN SHORE NOVA SCOTIA (SFA 20)

1. SPECIES / STOCK:

- SFA 20 Eastern Shore Nova Scotia

2. ARRANGEMENTS:

DATE: December 19, 1996
TIME: 7:00 p.m.
LOCATION: Sheet Harbour at the Eastern Shore Wildlife Association's hall

3. FORM OF CONSULTATION

- Science and management; ZMAC

4. PARTICIPANTS

- Jack MacDonald, Eastern Shore Wildlife Association
- Gerald Hardy, Eastern Shore Wildlife Association
- Stan MacDonald, Eastern Shore Wildlife Association
- Bob Dunn, Eastern Shore Wildlife Association
- Allan MacPherson, Salmon River Guysborough
- John Sullivan, Salmon River Guysborough
- Jim O'Melia, Musquodoboit River Association
- Marie O'Melia, Musquodoboit River Association
- Wayne Higgins, Musquodoboit River Association
- Steve McClair, Musquodoboit River Association
- Bob Bancroft, Nova Scotia Department of Fisheries
- Greg Stevens, Fisheries and Oceans, Fisheries and Habitat Management Branch
- Alex Mac Isaac, Fisheries and Oceans, Area Managers Office
- Paul McClung, Brian Gillis, Sherbrooke Conservation and Protection Office, DFO
- Kevin Juteau, Rick Devine, Musquodoboit Conservation and Protection Office, DFO
- Gordon Holman, Eastern Shore Wildlife Association
- Cyril Murphy, Eastern Shore Wildlife Association

5. NEW INFORMATION BROUGHT FORWARD

- A. MacPherson: Anglers on Salmon River caught fish throughout the river not just at tide as in the recent past. Believes the fish caught right at salt water and released probably die due to scale loss etc.
- R. Devine, DFO officer from Musquodoboit: There were only 36 fish marked in the mark recapture on the river, not 37 because one of the fisherman marked a previously marked fish. This will affect your estimate.

6. CONCERNS RAISED BY CLIENTS

- Hatchery programs: divestiture will cause us to lose our fisheries on at least 2 and possibly 3 rivers. What can we do about it? Eastern Shore Wildlife Association (ESWA)or others to

contact Dr. J. Ritter of DFO, Atlantic Salmon Federation, NSSA or other groups to develop a strategy to maintain their fisheries.

- Angling data is obviously important so what can we do to ensure anglers fishing for salmon buy licenses and submit their catch and effort information? Do you have a procedure planned or in place to enforce the purchase of salmon licenses by those who fish salmon rather than letting them hook-and-release salmon under the guise of fishing for trout? DFO is reviewing the problem and will discuss with the province (G. Stevens, DFO to action).
- Will DFO begin collecting broodstock on West River S.H. and grow fish to release as smolt to help restore the stock there? DFO is not initiating any new programs under the current divestiture process so the ESWA was directed to present their request to the incoming managers of the enhancement facilities.
- Liming on East River in 1997 will not proceed unless an advance from the coop agreement can be arranged. S. O'Neil to contact K. Rodman of DFO to determine whether the application was received and is being actioned.

7. RECOMMENDATIONS:

a.) Pertaining to Assessment

- Ensure salmon anglers buy licenses if they intend to fish for salmon otherwise any assessment which relies on exploitation rate to estimate returns, such as on the St. Mary's River, may be inaccurate.

b.) Pertaining to next year's workplans

- Attempt to complete a more robust mark and recapture on the Musquodoboit River similar to the 1996 program; begin organizing same earlier in the year.

Other Concerns:

- Minutes were also recorded by Alex MacIsaac; those notes were incorporated into the various sections of this form.

Shane F. O'Neil — NAME OF PRESENTER

Alex MacIsaac; Shane F. 'Neil — NAME OF RAPPORTEUR

ATLANTIC SALMON SFA 21

1. SPECIES / STOCK:
- Atlantic salmon in SFA 21 with emphasis on Upper LaHave River

2. ARRANGEMENTS:

DATE: January 10, 1997
TIME: 10:00
LOCATION: Wandlyn Inn, Bridgewater

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC..)
- Zone Management Advisory Committee (ZMAC)
- Preliminary stock assessment presented
- Stakeholder input and review requested

4. PARTICIPANTS (Name and Affiliation)
- ZMAC list
- Open to any interested participant
- 24 attended

5. NEW INFORMATION BROUGHT FORWARD (what? by who?)
- DFO - First count-based estimate of 19, 934 wild smolt above Morgan Falls (MF).
- DFO - 1996 Estimated angling catch rate of 44% and exploitation of 30% in LaHave River.
- DFO - First use of non-return fallback at MF in assessment above MF.
- DFO - Using a 40% non-return in MF counts indicates 60% of requirement above MF in 1996.
- DFO - Total river escapement based on MF count as index, indicates 82% of requirement in 1996.
- DFO - Forecast escapement above MF in 1997 is 88% of requirement with fisheries as in 1996.

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).
- Hatchery divestiture, impacts (negative) have not been assessed.
- More rivers need to be included in pH surveys, i.e. Petite River.
- Lowhead dam at MF may be holding fish from falling back down river.
- ZMAC or sub-committee must have input to future hatchery programs.

7. RECOMMENDATIONS:

a.) Pertaining to Assessment
- **Non-return fallback needs to be based on more than 17 tags**

b.) Pertaining to next year's workplans
- Continue to count smolts at MF Hydro .

- Eelectrofish West River below the liming project.
- Conduct a total river escapement estimate (estuarial trapping).
- Conduct a fallback study at MF (radio tagging).

	Peter G. Amiro, Biologist
NAME OF PRESENTER	**NAME OF RAPPORTEUR**

ATLANTIC SALMON SAINT JOHN (SFA 23)

1. SPECIES / STOCK:

- Atlantic Salmon Saint John SFA 23

2. ARRANGEMENTS:

DATE: January 9, 1997
TIME: 10:00 am
LOCATION: Lord Beaverbrook Hotel, Fredericton, NB

3. FORM OF CONSULTATION (Science Workshop, ZMAC, ETC..)

- ZMAC 23

4. PARTICIPANTS (Name and Affiliation)

- Frank Wilson (NB Wildlife Federation Inc)
- Betty Ann Lavallée (NB Aboriginal Peoples Council)
- Jim Gillespie (NB Salmon Council)
- Ben Macaulay (Kennebecasis Salmon Assoc.)
- Bob O'Donnell (Tobique Salmon Protective Assoc.)
- Paul Daigle (alternate; Hammond River Angling Assoc.)
- Allen Abbott (Bay of Fundy Driftnetters Assoc.)
- Bob Paul (Oromocto First Nation)
- Jonathan Carr and Danny Bird (Atlantic Salmon Federation)
- Michael Brislain (Saint John River Salmon Anglers Assoc.)
- Peter Birney (Union of NB Indians)
- Tom Pettigrew, Peter Cronin and Charles Ayre (NBDNRE)
- Carol Ann Rose, Chair; Larry Marshall, Ross Jones, Jack Davis, Marcel Mazerolle and Jennifer Cameron (DFO)
- Douglas Clay (Parks Canada)
- Frank Palmater (obsv. NB Aboriginal Peoples Council)
- Dallas Moyer (obsv. Commercial Harbour Fishery)
- Carl Urquhart (obsv. NB Salmon Council)
- Gordon Bickerton (obsv. Kennebecasis Salmon Assoc.), John Mallery (obsv, DFO).

5. NEW INFORMATION BROUGHT FORWARD (what? by who?)

6. CONCERNS RAISED BY CLIENTS (include concerns, plus follow-up action/response made or committed).

- None concerning assessment or process.

7. RECOMMENDATIONS:

a.) Pertaining to Assessment

- None

b.) Pertaining to next year's workplans
None.

Other Concerns:

- **Frank Palmater** - Would like copies of overheads prior to any future meetings. *(Request declined)*
- **Ben Macauly** - Decline of salmon in the Big Salmon River is directly linked to the construction of the Petitcodiac causeway which has disrupted the food cycle (lack of food) in the inner Bay of Fundy and to the piping of waste from the Potcan potash mine to the Bay of Fundy, St. Martins area. He suggested that wastes be disposed of underground as is done at Hillsdale. The Saint John River would be a more productive system if a portion of the flowage from the Allagash River (tributary) headwaters were rediverted from the Penobscot drainage. (No response)
- **Frank Wilson** - Requested an update on the divestiture of the Mactaquac hatchery *(No new information on hand).*
- **Danny Bird** - Commented on the increasing proportion of hatchery returns to the Saint John system and suggested that the hatchery had prolonged a decline of the Saint John stock relative to that of other inner and outer Fundy rivers.
- **Bob O'Donnell** - Inquired as to what became of the early-run component that once ascended the Tobique in mid-May and what DFO's policy will be regarding gillnets on the river in 1997 *(Suggested that earliest component had been lost but, forgot to mention the possibility of delay at Mactaquac caused by early-season discharge and inoperability of fishway).*
- **Frank Palmater** - Concerned over the quality of the salmon taken in the food fishery this year. He wanted information on the pollution levels for the Saint John system and is still concerned that the municipalities continue to dump their snow adjacent to the river. *(contacts provided by C&P and NBDNRE)*

Larry Marshall
NAME OF PRESENTER

Ross Jones
NAME OF RAPPORTEUR

Part III

Appendices

APPENDIX 1.1

Science Branch
Maritimes Region
343 Archibald Street
Moncton, N.B.
E1C 9B6

January 20, 1997

«Title» «FirstName» «LastName»
«JobTitle»
«Company»
«Address1»
«Address2»
«City», «State»
«Postal_Code»

Dear «Title» «LastName»:

This letter gives notice of the scientific peer review session for Maritimes Region diadromous fish stocks. The review will take place February 3-7, 1997, in the Miramichi Room (5th Floor, Room 544) of the Gulf Fishery Centre, 343 Archibald Street, Moncton, N. B. It will commence at 11:00 a.m. on Monday, the 3rd.

You and/or representatives of your organization are welcome to come and participate in the discussion of those stocks in which you have interest. Formal referees have been named for each stock presentation, but time is being made available for others, such as yourself, who might have questions or wish elaboration on a particular stock assessment. Enclosed is a proposed agenda and schedule for presentation of the various stock assessments.

We hope your interests will be represented at the review. However, we are unable to assist with travel expenses.

Sincerely yours,

J. A. Ritter
Manager
Diadromous Fish Division

Attachment

APPENDIX 1.2

Chief Robert Atwin
Kingsclear First Nation
P.O. Box 19
R.R. #6
Fredericton, N.B.
E3B 4X7

Chief Michael Augustine
Red Bank First Nation
P.O. Box 120
Red Bank, N.B.
EOC 1W0

Mr. Gilles Babin
Park Biologist
Kouchibouguac National Park
Kouchibouguac
Kent Co., N.B.
EOA 2A0

President Second Peter Barlow
Union of New Brunswick Indians
385 Wilsey Road
Comp. 44
Fredericton, N.B.
E3B 5N6

Chief Second Peter Barlow
Indian Island First Nation
R.R. #2Site 7, Box 1
Rexton, N. B.
EOA 2L0

Chief Arthur Bear
St. Mary's First Nation
247 Paul Street
Fredericton, N.B.
E3A 2V7

APPENDIX 1.2

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APPENDIX 1.4

Attendees:	Referee Yes/No	Affiliation	Location	Days in attendance Feb 3/4/5/6/7
Ritter, John	No	DFO, Science	Chair - Moncton	3-7
Adams, Nancy	Yes	N.S. Dept. of Fisheries	Pictou, N.S.	6
Aitken, Doug	No	DFO, Saint John Hatch.	Saint John, N.B.	3-7
Amiro, Peter, G.	No	DFO, Science	Halifax	3-7
Angus, Randy	No	DFO, Cardigan	Cardigan, PEI	4-6
Atkinson, Gary	No	DFO, Science	Moncton	3-7
Bielak, Alex	No	Federal Dept of Environment	Dartmouth	5
Bourgeois, Chuck	Yes	DFO, Science	St. John's, Nfld.	5-6
Bradford, Rod	Yes	DFO, Science	NS	3-6
Cairns, David	No	DFO, Science	Charlottetown, PEI	3-7
Caissie, Daniel	Yes	DFO, Science	Moncton	3-7
Cameron, Paul	No	DFO, Charlo SEC	Charlo	4-6
Caron, François	Yes	MEF, Québec	Québec	3-7
Chaput, Gérald	No	DFO, Science	Moncton	3-7
Chiasson, Alyre	No	Université de Moncton	Moncton	3-7
Corey, Francis	No	NS Native Council	Truro	4-6
Cronin, Peter J.	Yes	NB Dept. Nat. Resoures & Energy	Fredericton	3,4,5
Cunjak, Rick	Yes	DFO, Science	Moncton	3-6
Curry, Allen	Yes	NB Coop F&W Unit/UNB	Fredericton	3-5
Davidson, Kevin	Yes	DFO, Science	Moncton	3-7
Drinkwater, Ken	Yes	DFO, Science	BIO, Dartmouth	4
Dunn, Dave	No	DFO, Fisheries Management	Moncton	3,4.5 (part)
Goff, Trevor	No	DFO, Mersey Fish Hatch	Mersey, Mitton	3-7
Green, Tom	No	Oromocto First Nation	Fredericton	4
Groman, Dave	Yes	Atlantic Vet. College	Charlottetown, PEI	6
Harvie, Carolyn	Yes	DFO, Science	Halifax	3-7
Hooper, Bill	Yes	NB Dept Nat. Resources & Energy	Fredericton	3-5
Jesty, Frank	No	NS Native Council	Truro	4-6
Killam, Bob	No	DFO, Science	Moncton	3-7
Lacroix, Gilles	Yes	DFO, Science	St. Andrews, NB	4
Locke, Andrea	No	DFO, Science	Moncton	3-7
Lutzac, Tim	Yes	DFO, Science	Moncton	3-7
MacLean, Dave	No	St. Croix Int' Waterway Comm.	St. Stephen	4
Mallery, John	No	DFO	Fredericton	3-4
Marshall, Larry	No	DFO, Science	Halifax	3-7
Meade, Dave	No	N.S. Power Inc.	Halifax	4-6
Meerburg, Dave	Yes	DFO, Science	Ottawa	3-6
Miyakoshi, Yasuyuki	No	Hokkaide Fish Hatchery	Japan	3-6

Moore, Dave	No	DFO, Science	Moncton	3-5
Morin, Mike	No	DFO, Science	Moncton	3-7
Mowbray, Fran	No	DFO, Science	Moncton	3-7
O'Neil, Shane	No	DFO, Science	Halifax	3-7
Palmater, Frank	No	NB Aboriginal Peoples Council	Fredericton	
Paul, Bob	No	Oromocto First Nation	Fredericton	4
Peress, Josée	No	MEF, Québec	Québec	3-7
Prevost, Etienne	Yes	INRA, France	Rennes, France	3-7
Sochasky, Lee	No	St. Croix Int' Waterway Comm.	St. Stephen	4-6
Watt, Walton	Yes	DFO, Science	Halifax	3-4
Whoriskey, Fred	Yes	Atlantic Salmon Federation	St. Andrews	3-7

APPENDIX 1.5

A G E N D A (with Rapporteur assignments)

FOR 1996 DIADROMOUS FISH STOCK ASSESSMENT PEER REVIEW
FEBRUARY 3-7, 1997

Monday, February 3

AM	11:00	- Introduction and Orientation
		- Lunch
PM		- Atlantic salmon Miramichi (Rapporteur - David Moore)
		- Coffee
		- Atlantic salmon Restigouche (Fran Mowbray)

Tuesday, February 4

AM	8:30	- Housekeeping Remarks
		- Atlantic salmon Nepisiguit (Russell Pickard)
		- Coffee
		- Atlantic salmon Boutouche (Mark Hambrook)
		- Freshwater Environmental Conditions (Kevin Davidson)
		- Lunch
PM		- Atlantic salmon Southwest New Brunswick (Ross Jones)
		- Coffee
		- Freshwater Acidity Conditions (Carolyn Harvie)
		- Marine Environmental Conditions (TBA)

Wednesday, February 5

AM	8:30	- Housekeeping Remarks
		- Atlantic salmon Inner Bay of Fundy (Doug Aitken)
		- Coffee
		- Atlantic salmon South Shore Nova Scotia (Eric Jefferson)
		- Lunch
PM		- Atlantic salmon Tabusintac (Paul Cameron)
		- Atlantic salmon Quebec stocks (n/a)
		- Coffee
		- Striped bass Southern Gulf (Gary Atkinson)

Thursday, February 6

AM	8:30	- Housekeeping Remarks
		- Atlantic salmon North Shore Nova Scotia (Dave Longard)
		- Coffee
		- Atlantic salmon Prince Edward Island (Randy Angus)
		- Lunch
PM		- Atlantic salmon Eastern Shore Nova Scotia (Trevor Goff)
		- Coffee

- Atlantic salmon Cape Breton(Paul LeBlanc)

APPENDIX 1.5

Friday, February 7

AM	8:30	- Atlantic salmon Regional Overview (John Ritter)
	10:30	- Petersen Estimator: Review and Improvements - Manon Mallet (n/a)
		- Closing comments

APPENDIX 1.6

Maritimes Region
Science Branch
343 Archibald Street
Moncton, N.B. E1C 9B6

«Title» «FirstName» «LastName»
«JobTitle»
«Company»
«Address1»«Address2»«
City», «State»«PostalCode»

Dear «Title» «LastName»:

This letter is to confirm my invitation to you to serve as a referee at the Diadromous Fish Stock Peer Review to be held February 3-7, 1997. The review will take place in the Miramichi Room (5th Floor, Room 544) of the Gulf Fishery Centre, 343 Archibald Street, Moncton, N.B. It will commence at 11:00 a.m. on Monday, the 3rd.

The paper(s) that we are asking you to review is (are) attached. Also included for your information and guidance, are copies of both the Agenda for the Peer Review and some suggested "Considerations for Referees". You are welcome to participate in all or any of the review sessions. You will note from the Agenda that this Peer Review extends through most of the week and encompasses all the salmon stocks for the Maritime Provinces. As well, the assessment for the striped bass stock for the southern Gulf will be reviewed.

We are pleased to reinburse you for your travel, accommodations and food costs. Regarding accommodations, a blanket booking has been made at the Confort Inn East (Champlain Circle), from February 3-6 (Monday through Thursday). If these accommodations are acceptable to you, it is essential that you confirm your reservation by January 27th, 1997. The Confort Inn's reservation numbers are (506) 859-6868 / 1-800-424-6423. Should you choose other accommodations, and are not employed by the federal government, please indicate that your expenses are being paid by the federal government and that you have been asked to seek the government rate. Should they wish proof of this, you may either show them this letter or refer them to Marie Daigle of DFO at 506-851-6253.

I look forward to working with you to ensure a thorough review of our diadromous stock assessments.

Sincerely,

John A. Ritter, Manager
Diadromous Fish Division

Attachment

APPENDIX 1.7

1996 DIADROMOUS FISH STOCK ASSESSMENT PEER REVIEW SCHEDULE (excluding gaspereau stocks)

SPECIES	ASSESSMENT STOCK	LEAD	REFEREE #1	REFEREE #2
ATLANTIC SALMON	Restigouche	Locke	Fred Whoriskey	Carolyn Harvie
	Nepisiguit	Locke	Francois Caron	Bill Hooper
	Tabusintac	Bradford	Tim Lutzac	Etienne Prevost
	Miramichi	Chaput	Francois Caron	Rick Cunjak
	Boutouche	Atkinson	Rod Bradford	Tim Lutzac
	PEI/Morell	Cairns	Kevin Davidson	David Groman
	North Shore Nova Scotia	O'Neil	Chuck Bourgeois	Nancy Adams
	Cape Breton	Marshall	Alyre Chaisson	Etienne Prevost
	Eastern Shore Nova Scotia	O'Neil	Fred Whoriskey	Nancy Adams
	South Shore Nova Scotia	Amiro	Rod Bradford	Chuck Bourgeois
	Inner Bay of Fundy	Amiro	Allen Curry	Dave Meeburg
	Southwest New Brunswick	Marshall	Gilles Lacroix	Allen Curry
STRIPED BASS	Southern Gulf	Chaput & Bradford	Brian Jessop	Peter Cronin
ENVIRONMENTAL CONDITIONS	Freshwater	Caissie	Ken Drinkwater	Walton Watt
	Acid rain	Watt	Rick Cunjak	Daniel Caissie
	Marine	Drinkwater	N/A	N/A